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**Miller**

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(54) **TREE TRUNK SNAIL SHIELD AND METHOD OF PREVENTING SNAILS FROM ACCESSING THE UPPER PORTIONS OF A TREE**

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**A01G 13/10** (2006.01)

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CPC ..... **A01G 13/105** (2013.01)

(58) **Field of Classification Search**  
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A01M 1/103; A01M 1/18  
USPC ..... 43/108, 109, 120, 121; 47/32.5  
See application file for complete search history.

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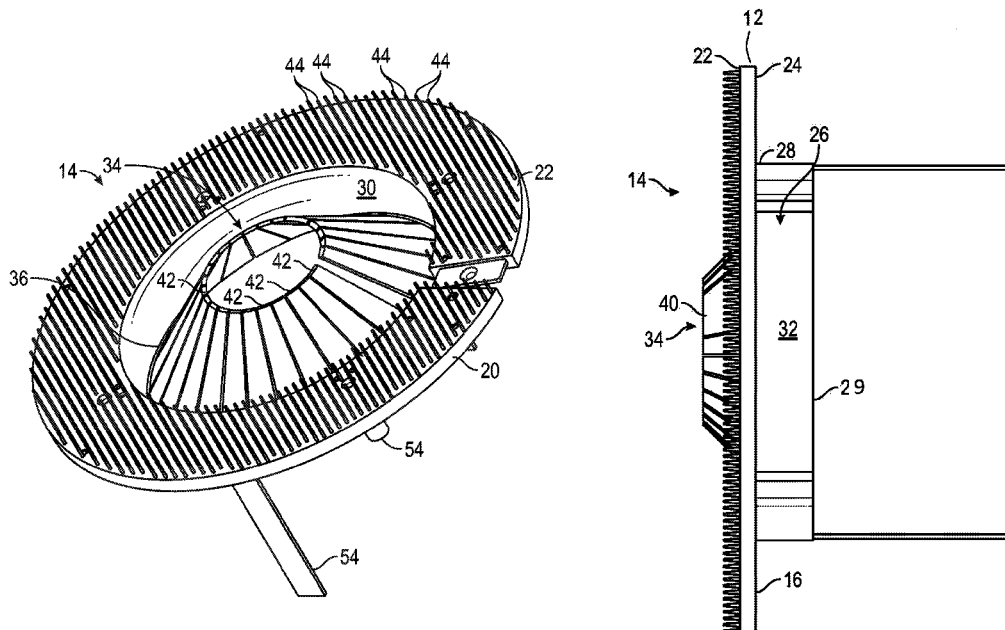
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(57) **ABSTRACT**

A device attaches to the trunks of plants and trees to prevent snails from reaching the upper portion of the plant or tree which has leaves and fruit subject to attack from the snails. Embodiments of the device have an inner funnel-shaped sleeve which biases against the tree trunk to provide a sufficiently tight closure to prevent snails from climbing between the trunk and the device. Embodiments of the device have a downward facing surface having a plurality of closely-spaced downwardly facing spike members. These spike members are sufficiently closely spaced so as to substantially or completely prevent snails, including small-sized young snails, from moving across the downwardly facing surface to crawl around the outside of the device to gain access to the upper portion of the tree.

**9 Claims, 5 Drawing Sheets**



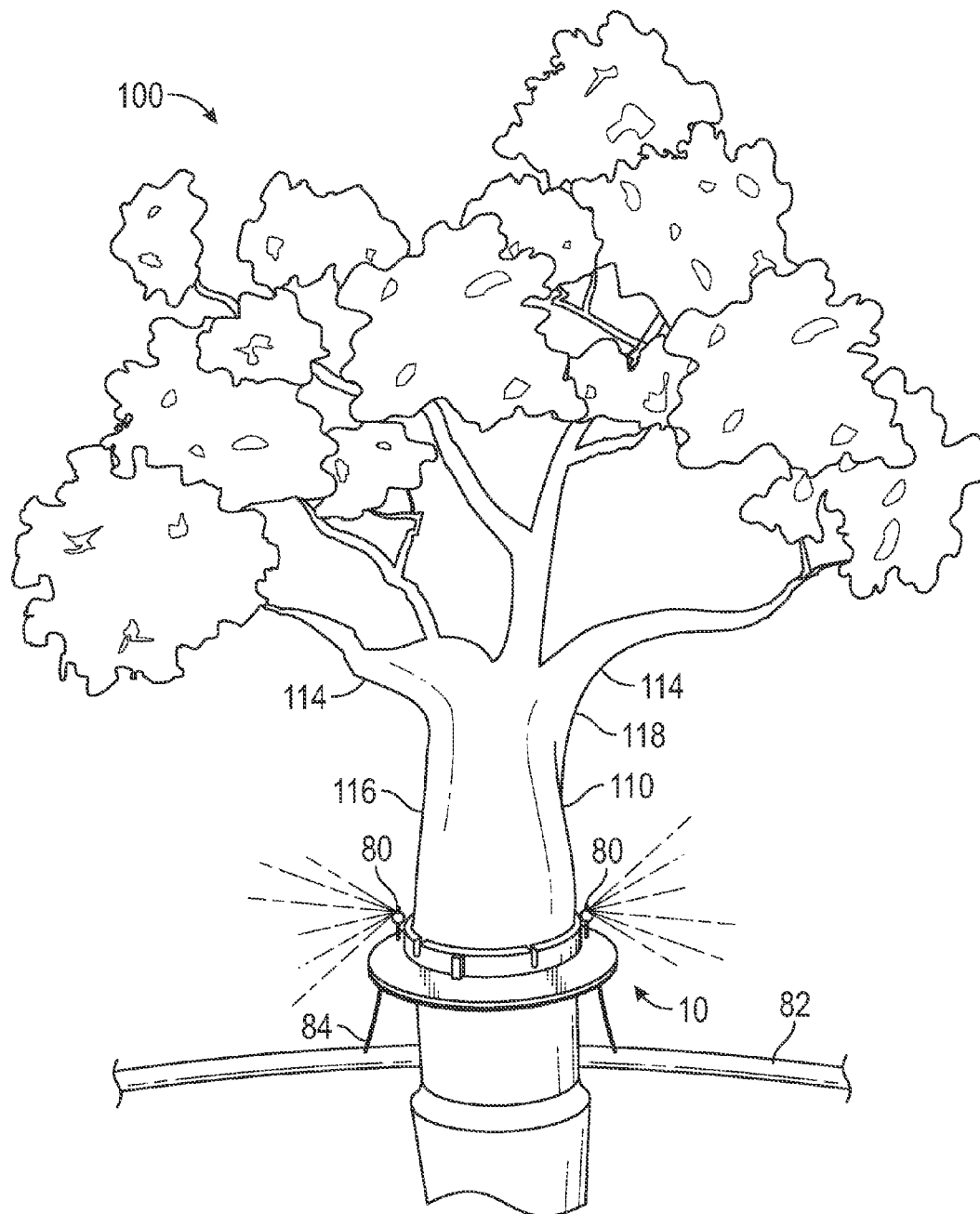


FIG. 1

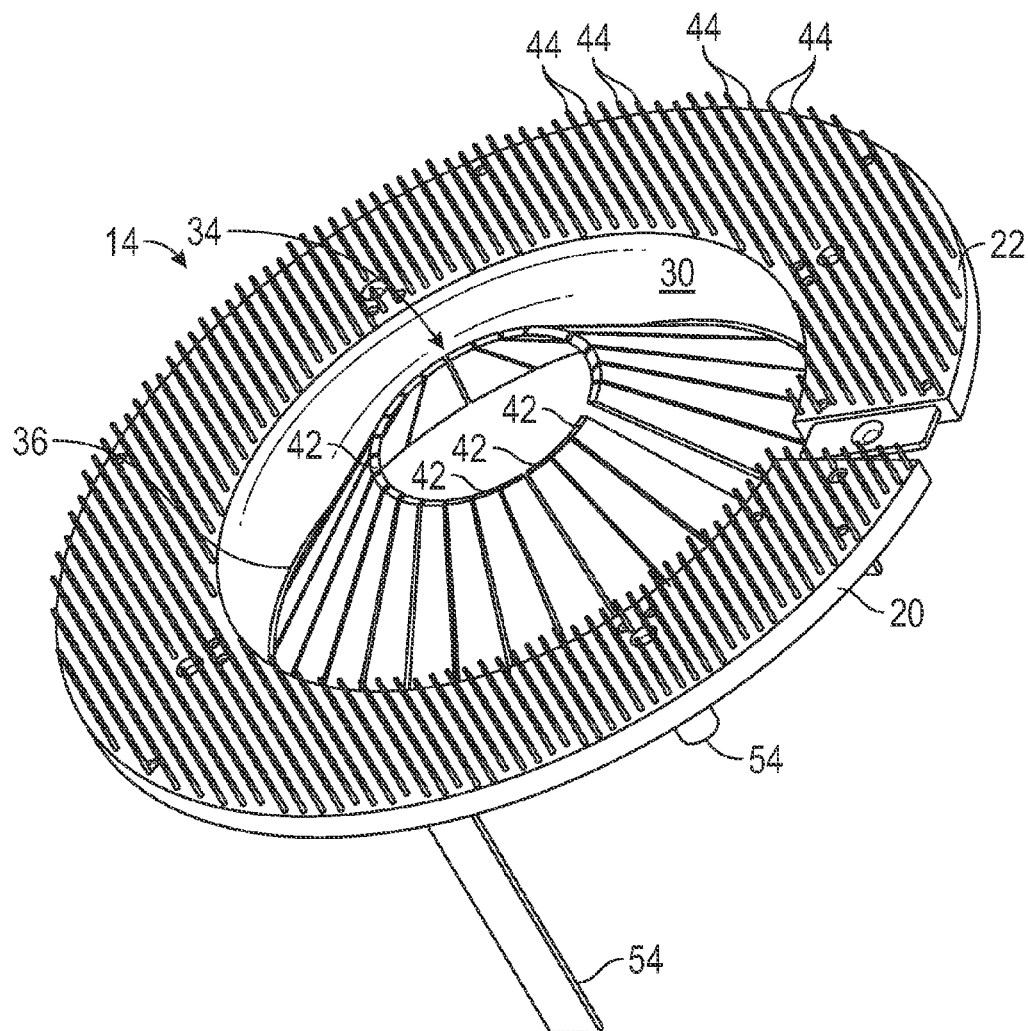


FIG. 2

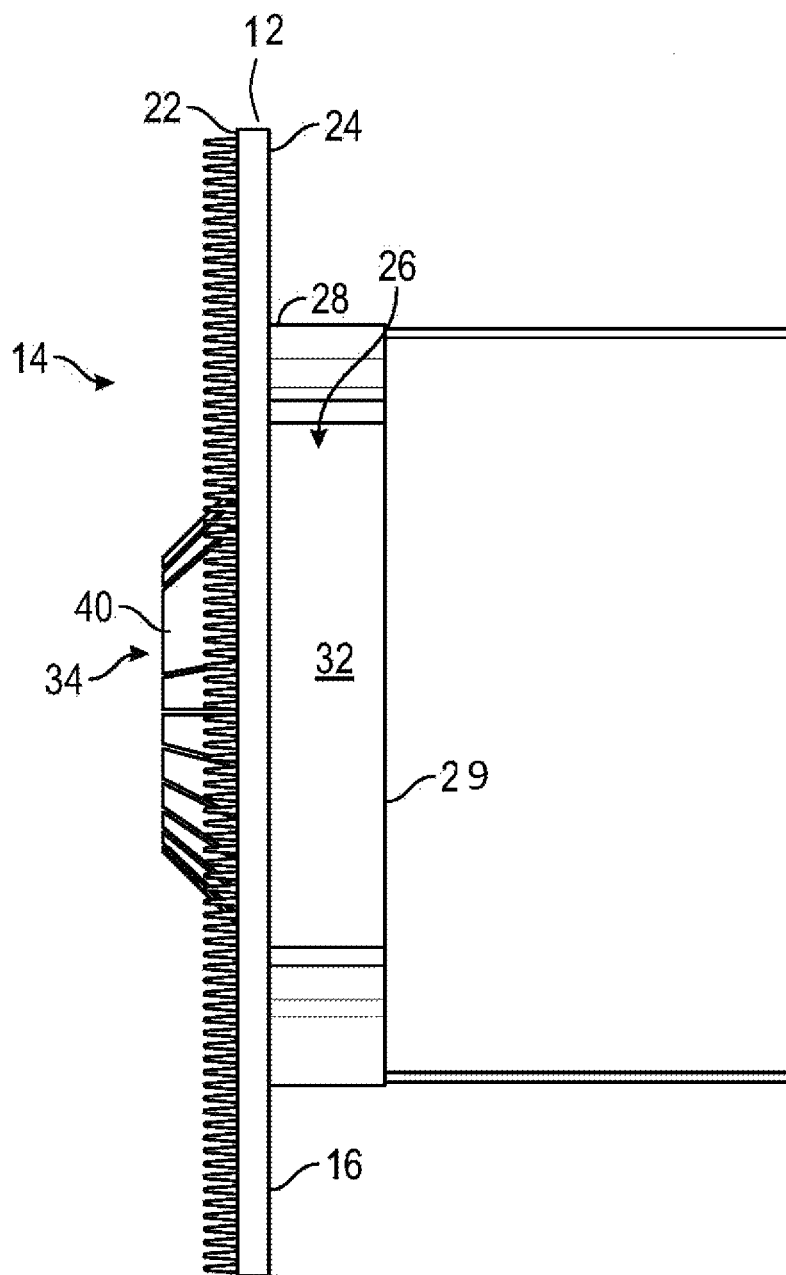


FIG. 3

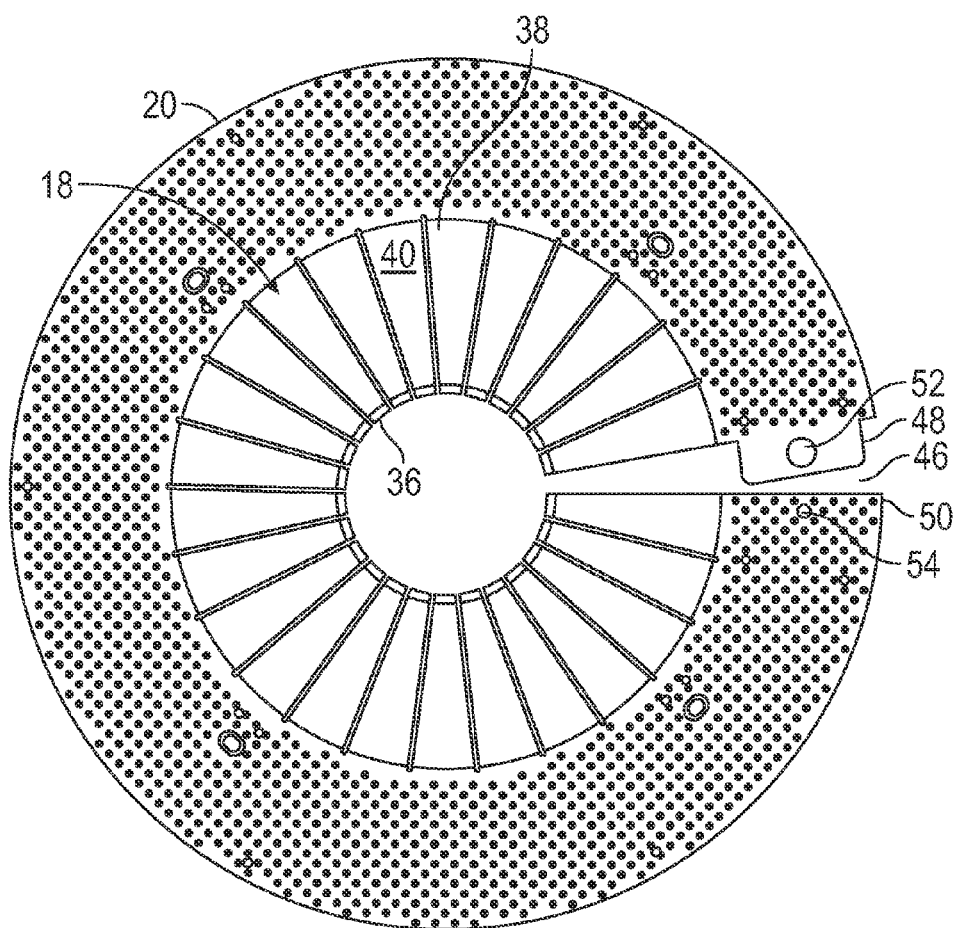


FIG. 4

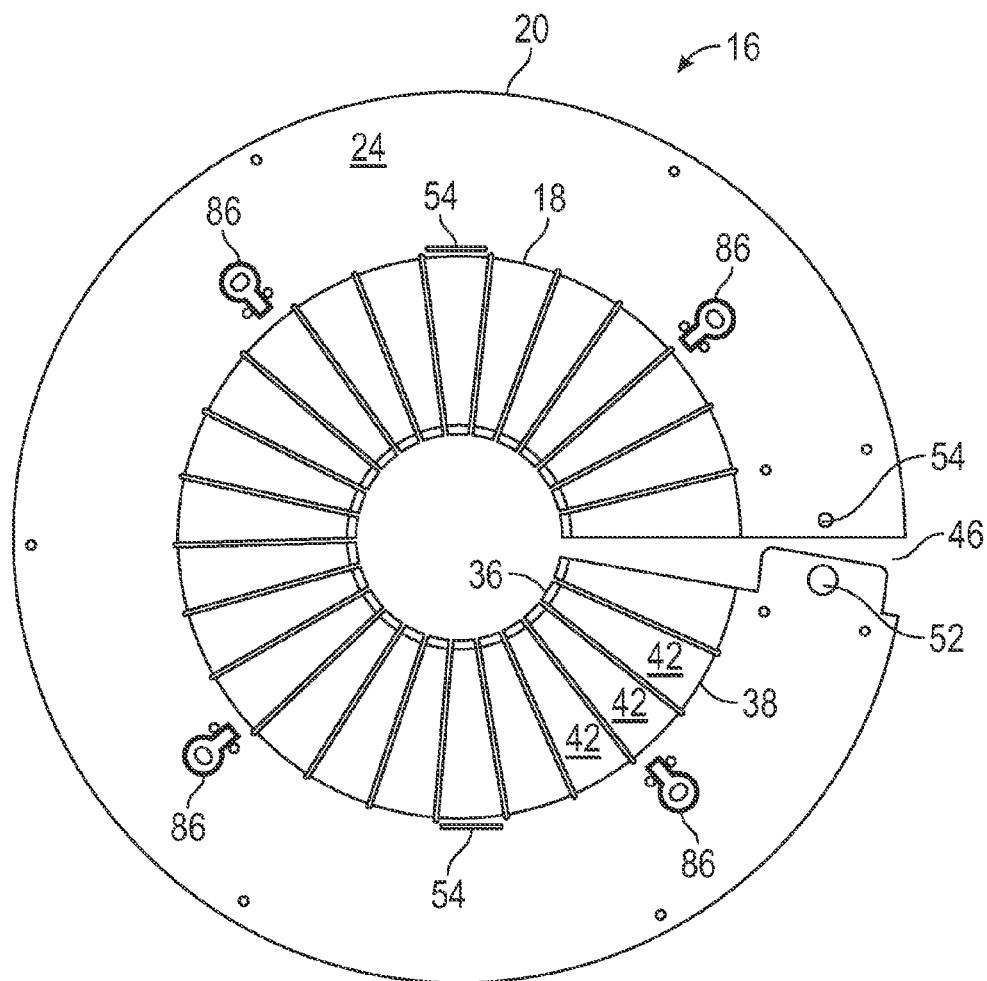


FIG. 5

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# **TREE TRUNK SNAIL SHIELD AND METHOD OF PREVENTING SNAILS FROM ACCESSING THE UPPER PORTIONS OF A TREE**

## **BACKGROUND OF THE INVENTION**

This invention generally relates to methods and apparatus for preventing snails from damaging plants, trees, flowers, and fruit. This invention more particularly prevents snails from gaining access to the leaves, flowers, and fruit of large plants and trees. This invention further provides a platform for mounting irrigation emitters.

Snails can inflict severe damage to plants and trees, and to fruit growing on the plants and trees. With respect to trees, citrus trees and citrus fruit are especially susceptible to damage. Snails are most active at night, and will typically seek hiding places to avoid sun and bright light. Shady areas and areas with dense ground cover provide shelter for snails. Such shelters are frequently found in orchards. The conventional techniques for controlling snails include hand picking of the snails from foliage and ground surface, use of toxic snail baits, utilizing barriers, and traps. It is also known to utilize barriers on the trunks of trees and plants. All of the techniques have various levels of effectiveness, some more effective than others. However, many have various drawbacks as well with respect to expense, practicality, danger to young children and animals, and, with respect to traps, the unpleasant task of disposing of a large number of snails.

## **SUMMARY OF THE INVENTION**

Embodiments of the present invention provide an effective apparatus which is specifically directed to preventing snails from gaining access to the portions of plants and trees which are above the apparatus. For purposes of this disclosure, the phrase "upper portions of the tree" shall refer to those portions of the tree which are above the device. When used in the present application, the terms up, upwardly, down and downwardly are made with respect to the ground surface, such that "upwardly" refers to the direction away from the ground surface, etc. The terms inwardly and outwardly are made with respect to tree trunk or plant trunk, such that "inwardly" refers to towards the trunk and "outwardly" refers to away from the trunk. The term "trunk" shall be understood to refer to trunks of both plants and trees, and the terms "plant" and "tree" shall be understood to be synonymous for purposes of this disclosure.

An embodiment of the present apparatus provides a barrier which encircles the trunk of a tree as a ring. This barrier comprises a downwardly facing surface which may comprise a plurality of closely-spaced downwardly facing spike members. These spike members are sufficiently closely spaced so as to substantially or completely prevent snails, including small-sized young snails, from moving across the downwardly facing surface. For example, the spike members may have a density of thirty spikes or more per square inch, such that the spaces between adjacent spikes might be smaller than one quarter inch.

The interior portion of the ring barrier comprises a plurality of adjacent radially disposed barrier members, the barrier members having an outside edge and an inside edge. These barrier members are configured such that the assembled group of barrier members form a funnel configuration, with the outside edges of the barrier members defining an outer rim when the barrier members are assembled together. An inner rim is defined by the assembled inside edges. The outside

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edges of each barrier member may be attached to a sleeve member to which the ring barrier is attached. When thus attached to the ring barrier, for an apparatus properly sized for a particular trunk, the inside edges of the barrier members will be biased against the outside surface of the tree. The side edges of each barrier member abut, or nearly abut, the side edges of the adjacent barrier member. Thus configured, the assembled barrier members join tightly about the trunk, preventing snails from crawling between the ring barrier and the tree, or from crawling between adjacent barrier members.

Embodiments of the ring barrier are fabricated from relatively flexible plastic materials, which allow the memory of the material to provide the necessary biasing properties such that the barrier members will remain biased against the tree trunk. The ring barriers must also allow the ring barrier to be opened so that it may be placed about a tree trunk. In one embodiment of the ring barrier, the device is a single piece having one portion of the ring in which the ring opens at a break to allow it to be slipped around the tree trunk. This embodiment will include closure structure, such as pins on one side of the break and holes on the other side of the break, where the pins engage the holes to close and lock the ring around the tree trunk. Other embodiments of the device, the ring barrier may be fabricated from several arc-shaped sections, where the arc-shaped sections are connected together to form the ring.

Embodiments of the device may further comprise attachment strips which allow the device to be secured to a tree trunk with nails or screws. Embodiments of the device may further comprise apertures for inserting and anchoring irrigation emitters. For this embodiment, the device provides a secure platform for anchoring irrigation emitters and directing water away from the trunk or base of the tree. Water can cause problems when sprayed directly onto the trunks of citrus trees. The present invention keeps the emitters above the ground and provides an irrigation point which delivers water away from the base of the tree in a desirable pattern.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 shows an embodiment of the invention as installed on a tree trunk.

FIG. 2 shows a perspective view, looking towards the bottom, of an embodiment of the present invention.

FIG. 3 shows a side view of an embodiment of the present invention.

FIG. 4 shows a bottom view of an embodiment of the present invention.

FIG. 5 shows a top view of an embodiment of the present invention.

## **DETAILED DESCRIPTION OF THE INVENTION**

Referring now to the figures, FIG. 1 shows a tree 100 having a trunk 110. As shown in FIG. 1, embodiments of the disclosed shield 10 attach to a lower section of trunk 110 by encircling the trunk. As indicated in FIG. 1, the shield 10 will typically be installed beneath the point of the trunk 110 from which major branches 114 begin to grow out from the trunk. This section of trunk 110 which is below the major branches 114 shall be referred to as the lower section 116 of the trunk. The section of trunk 110 from which the major branches 114 begin or, alternatively, the section of trunk above the point where the shield 10 is installed, shall be referred to as the upper section 118 of the trunk. The shield 10 encircles the trunk 110 and provides a barrier which prevents snails from gaining access to the upper section 118 of the tree 100.

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The embodiment of the shield **10** depicted in FIG. **1** serves a secondary purpose of providing a platform for mounting irrigation emitters **80** which are connected to water line **82** by irrigation tubing **84**. Irrigation emitters **80** may be inserted into apertures **86** which are placed in ring **12**.

FIGS. **2-5** show different views of an embodiment of shield **10**. This embodiment of shield **10** has a ring **12** which has a bottom **14** and a top **16**. The ring **12** has an inside circular edge **18** and an outside circular edge **20**. The bottom **14** has a lower face **22** which extends between the inside circular edge **18** and the outside circular edge **20**. The top **16** has an upper face **24** which also extends between the inside circular edge **18** and the outside circular edge **20**.

This embodiment of shield **10** has a circular sleeve member **26** which coincides and extends from the inside circular edge **18**. The circular sleeve member **26** has a proximate edge **28** which is adjacent or in engaging contact with upper face **24**. Circular sleeve member **26** also has a distal edge **29** which extends upwardly away from the upper face **24**. The circular sleeve member has a surface **30** which faces inwardly (the "inward facing surface") and a surface **32** which faces outward (the "outward facing surface"). As best shown in FIG. **3**, the outward facing surface **32** is generally perpendicular to upper face **24**.

This embodiment of shield **10** also comprises a funnel member **34**. As best shown in FIG. **4**, funnel member **34** has a small diameter rim **36** and a large diameter rim **38**. The large diameter rim **38** is coupled, molded with, or otherwise attached to the inward facing surface **30**. Funnel member **34** further comprises a funnel surface **40** which extends between the large diameter rim **38** and the small diameter rim **36**. As shown in FIGS. **2-3**, large diameter rim **38** is positioned adjacent to the distal edge **29** of circular sleeve member **26** and small diameter rim **36** extends axially toward the lower face **22**. Funnel member **34** may comprise a plurality of adjacent radially disposed barrier members **42**. Radially disposed barrier members **42** have outside edges which define large diameter rim **38**. Radially disposed barrier members **42** have inside edges which define small diameter rim **36**.

Small diameter rim **36** forms an opening which is sized to encircle trunk **110**. Shield **10** may be fabricated from thermoplastic materials through injection molding or other known processes. The material properties of the plastic matrix forming shield **10** should be such that the radially disposed barrier members **42** which make up small diameter rim **36** are naturally biased. It is desired that when installed on a tree trunk **110**, that the inside edges of radially disposed barrier members **42** are abutting against the tree trunk **110**, with the memory of the thermoplastic material biasing the radially disposed barrier members **42** against the trunk **110**. This configuration provides a sufficient seal between the trunk **110** and the small diameter rim **36** to prevent snails from getting above the shield **10** and thus gaining access to the upper section **118** of the trunk **110**.

Lower face **22** may comprise a plurality of closely-spaced downwardly facing spike members **44**. These spike members **44** are sufficiently closely spaced so as to substantially or completely prevent snails, including small-sized young snails, from moving across the downwardly facing surface of lower face **22**. For example, the spike members **44** may have a density of thirty spikes or more per square inch, such that the spaces between adjacent spikes might be smaller than one quarter inch.

In order to be installed around a tree trunk **110**, embodiments of the shield **10** must have at least one break **46** which allows the ring **12** to be twisted or spread to open up a space between the two sides of the break so the device can be placed

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around the trunk **110**. Break **46** will have a first side **48** and a second side **50**. Various structures known in the art may be utilized with break **46** to attach first side **48** to second side **50** once the shield **10** has been placed around trunk **110**. By way of example, first side **48** may comprise an aperture **52** and second side **50** comprises a pin **52**. Other combinations of pins, apertures, buckles, clips, etc. may be utilized to close and lock the shield **10** around tree trunk **110**.

Embodiments of the shield **10** may further comprise various structures to prevent the shield **10** from sliding downward on trunk **110**. For example, shield **10** may comprise attachment strips **54** which extend upwardly from the circular sleeve member **26**. Attachment strips **54** may then be attached to trunk **110** by nails, screws, or other fasteners.

Having thus described the preferred embodiment of the invention, what is claimed as new and desired to be protected by Letters Patent includes the following:

1. In a tree having a trunk, an apparatus attaches to a lower section of the trunk and prevents mollusks from gaining access to an upper section of the trunk above the apparatus, wherein the apparatus comprises:

a ring for generally horizontal disposition about the trunk, the ring having a top, a bottom, an inside circular edge and an outside circular edge concentric with the inside circular edge, wherein a lower generally horizontal face is defined on the bottom extending between the inside circular edge and the outside circular edge and an upper generally horizontal face is defined on the top extending between the inside circular edge and the outside circular edge;

a circular sleeve member coinciding and extending from the inside circular edge, the circular sleeve member having a proximate edge adjacent to the upper face and a distal edge extending upwardly from the upper face, the circular sleeve member having an inward facing surface and an outward facing surface, the outward facing surface generally perpendicular to the upper face; and

a funnel member having a large diameter rim and a small diameter rim, the large diameter rim coupled to the inward facing surface, wherein the funnel member comprises a funnel surface which extends inwardly from the large diameter rim to the small diameter rim, wherein the large diameter rim is positioned adjacent to the distal edge of the circular sleeve member and the small diameter rim extends toward the lower face, wherein the small diameter rim is sized to encircle the trunk of the tree, wherein the funnel member comprises a plurality of immediately adjacent radially disposed barrier members, each barrier member having an outside edge and an inside edge, wherein the outside edges of the barrier members combine to form the large diameter rim and the inside edges of the barrier members combine to form the small diameter rim.

2. The apparatus of claim 1 wherein the lower face comprises a plurality of closely-spaced downwardly facing spike members.

3. The apparatus of claim 2 wherein the spike members have a spike density of at least thirty spikes per square inch.

4. The apparatus of claim 1 wherein the apparatus is molded from plastic materials as a single piece.

5. The apparatus of claim 4 wherein a break extends through the ring, circular sleeve member, and the funnel member, wherein the apparatus may be placed around the trunk of the tree by spreading the break apart and slipping the apparatus around the trunk.

6. The apparatus of claim 5 wherein the break has a first side and a second side, and the first side comprises a pin and



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the second side comprises an aperture into which the pin fits, the pin and aperture providing a closing structure for the break.

7. The apparatus of claim 1 further comprising attachment strips extending upwardly from the circular sleeve member 5 for attachment of the apparatus to the tree trunk.

8. The apparatus of claim 1 further comprising an aperture extending from the lower face through the upper face.

9. The apparatus of claim 8 further comprising an irrigation emitter disposed within the aperture. 10

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